OpenEye®

2MP Outdoor IR IP Bullet Camera

User Manual

Camera

CM-722I
CM-722AI
CM-722VF

www.openeye.net

2MP IR IP Bullet Camera (CM-722 Series)

User Manual

Manual Edition 31051AC – JULY 2013

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OPENEYE

Liberty Lake, WA ● U.S.A.

Important Safeguards

1. **Read Instructions**
   Read all of the safety and operating instructions before using the product.
2. **Retain Instructions**
   Save these instructions for future reference.
3. **Attachments / Accessories**
   Do not use attachments or accessories unless recommended by the appliance manufacturer as they may cause hazards, damage product and void warranty.
4. **Installation**
   Do not place or mount this product in or on an unstable or improperly supported location. Improperly installed product may fall, causing serious injury to a child or adult, and damage to the product. Use only with a mounting device recommended by the manufacturer, or sold with the product. To insure proper mounting, follow the manufacturer's instructions and use only mounting accessories recommended by manufacturer.
5. **Power source**
   This product should be operated only from the type of power source indicated on the marking label.

Precautions

Operating

- Before using, make sure power supply and others are properly connected.
- While operating, if any abnormal condition or malfunction is observed, stop using the camera immediately and then contact your local dealer.

Handling

- Do not disassemble or tamper with parts inside the camera.
- Do not drop or subject the camera to shock and vibration as this can damage camera.
- Do not block the cooling holes on the bracket. This camera has a cooling fan inside the housing. Blocking the cooling holes will cause heat to build up and cause malfunction.
- Care must be taken when you clean the clear dome cover. Scratches and dust will ruin the image quality of your camera. Do not use strong or abrasive detergents when cleaning the camera body. Use a dry cloth to clean the camera when it is dirty. In case the dirt is hard to remove, use a mild detergent and wipe the camera gently.

Installation and Storage

- Install electricity wiring carefully. Please note that input electricity to the unit is at tolerance of DC 12V/AC 24V ± 10%. The camera is capable of surge protection; ensure AC power model unit is grounded appropriately against damage by heavy current or electric shock.
- Do not install the camera in areas of extreme temperatures in excess of the allowable range. (-40°F ~ 122°F / -40°C ~ 50°C)
- Avoid installing in humid or dusty places. The relative humidity must be below 90%.
- Avoid installing in places where radiation is present.
- Avoid installing in places where there are strong magnetic fields and electric signals.
- Avoid installing in places where the camera would be subject to strong vibrations.
- Never face the camera toward the sun. Do not aim at bright objects. Whether the camera is in use or not, never aim it at the sun or other extremely bright objects. Otherwise the camera may be smeared and damaged.

Regulation

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This symbol on the product or on its packaging indicates that this product shall not be treated as household waste in accordance with Directive 2002/96/EC. Instead it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By proper waste handling of this product you ensure that it has no negative consequences for the environment and human health, which could otherwise be caused if this product is thrown into the garbage bin. The recycling of materials will help to conserve natural resources.

For more details information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Compliance is evidenced by written declaration from our suppliers, assuring that any potential trace contamination levels of restricted substances are below the maximum level set by EU Directive 2002/95/EC, or are exempted due to their application.

Warning

DANGEROUS HIGH VOLTAGES ARE PRESENT INSIDE THE ENCLOSURE.

DO NOT OPEN THE CABINET.

REFER SERVICING TO QUALIFIED PERSONNEL ONLY.

Caution

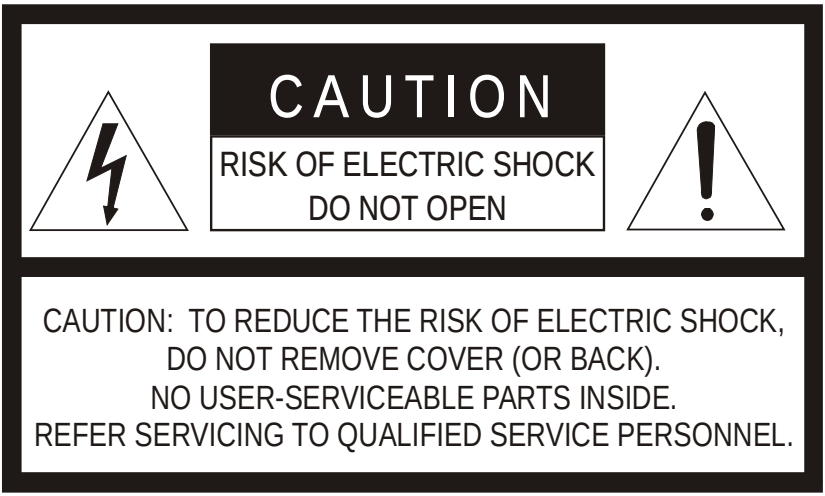

TABLE OF CONTENTS

Introduction 10

Overview 10

Product Features 10

Getting Started 11

Box Contents 11
Camera Overview 12

Dimensions 12
Connections 13
Micro SD Card Slot and Reset Button 14
Installing the Desiccant 16

Installation 17

Power and Ethernet Connection 17

Power Connection 17
Ethernet Cable Connection 17

Ceiling Installation 18
Lens Adjustment 19

Locate Camera 20

OpenEye Network Camera manager 20

Installation 20
Starting Network Camera Manager 20
Device Addressing 21

Finding Network Devices 21

Setup & Configuration 22

Connecting to the Camera 22

Resetting the Camera 22
Administrator/User Privileges 22
Connecting a Stream 23
Connecting Over the Internet 24

Viewer Software 25

Viewer Tabs 25
Home 26

CM-722I and CM-722VF Models 26

CM-722AI 27

System 28
System 28
Security 29
Admin Password 29
Add User 30
Delete user 30
Edit user 30
Network 31
Get IP address automatically (DHCP) 31
Use fixed IP address 32
DDNS 33
Mail 34
FTP 35
Application 36
Motion Detection 38
Storage Management 42
Recording 43
Snapshot 44
Information 45
System Log 45
View User Information 46
View User Privilege 46
Parameter List 47
Software Upgrade 48
Upgrading the Camera Viewer Software 48
Maintenance 50
Video and Audio Streaming Settings 51
Video Format 51
Text Overly Settings 51
Video Rotate Type 52
Video Compression 53
Video OCX Protocol 54
Multicast Mode 54
Frame Rate Control 55
Video Mask 56
Audio 57
Transmission Mode 57
Server Gain Setting 58

Bit Rate 58
Camera 59
Exposure 59
White Balance 60
Backlight Setting 60
Brightness 60
Sharpness 60
Contrast 61
Saturation 61
Digital Zoom 61
IR Function 61
TV System 61
Logout 61

Specifications 62

Camera Specifications 62
IR Specifications 63
IP Specifications 63

Appendix A 64

Set Up Internet Security 64
Setting Internet Security Level to Default 64
Adjusting ActiveX Controls and Plug-ins 65

INTRODUCTION

OVERVIEW

The OpenEye CM-722 series is a collection of 2MP outdoor IP bullet cameras built to provide superior video quality. All CM-722 cameras utilize MJPEG or H.264 compression to provide video at resolutions up to 1080p (2MP) and are capable of dual and quad streaming at 720p (1MP). Each camera in the CM-722 series is equipped with 23 IR LEDs and a mechanical IR cut filter for true day/night operation, allowing the camera to record high-resolution images at 0 Lux.

The CM-722I is equipped with all the standard features of the CM-722 line, while the CM-722AI includes a motorized lens and the CM-722VF includes a varifocal lens.

The CM-722 series is designed to operate in extreme conditions in a tamper-resistant housing. It is equipped with an integrated heater, allowing operation in temperatures as low as -40°F (-40°C). CM-722 cameras can be powered via 24vAC, 12vDC, or a PoE switch. 24vAC power is required to operate the on-board heater.

Product Features

- ONVIF™ compliant
- H.264 / MJPEG quad streaming
- 2MP resolution (1080p HD)
- IP66 weatherproof rating
- True Day/Night
- On-board heater
- 23 IR LEDs

GETTING STARTED

BOX CONTENTS

Before proceeding, please check that the box contains the items listed here. If any item is missing or has defects, DO NOT install or operate the product and contact your dealer for assistance.

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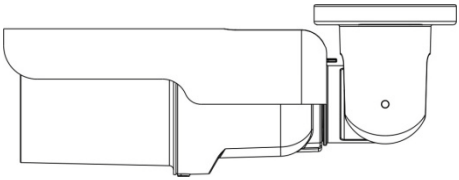
<tr><td colspan="2"> 
CM-722 Series Camera (Cable included)</td><td>
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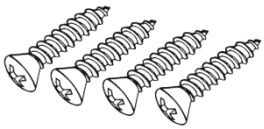
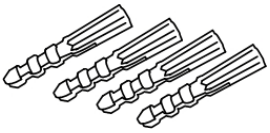
<tr><td> 
Self Tapping Screws</td><td> 
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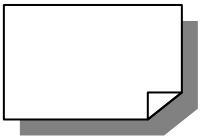
M4 Inner Hex Wrench</td></tr>
<tr><td> 
Quick Start Guide</td><td>
Desiccant Bag</td><td>
CD</td></tr>
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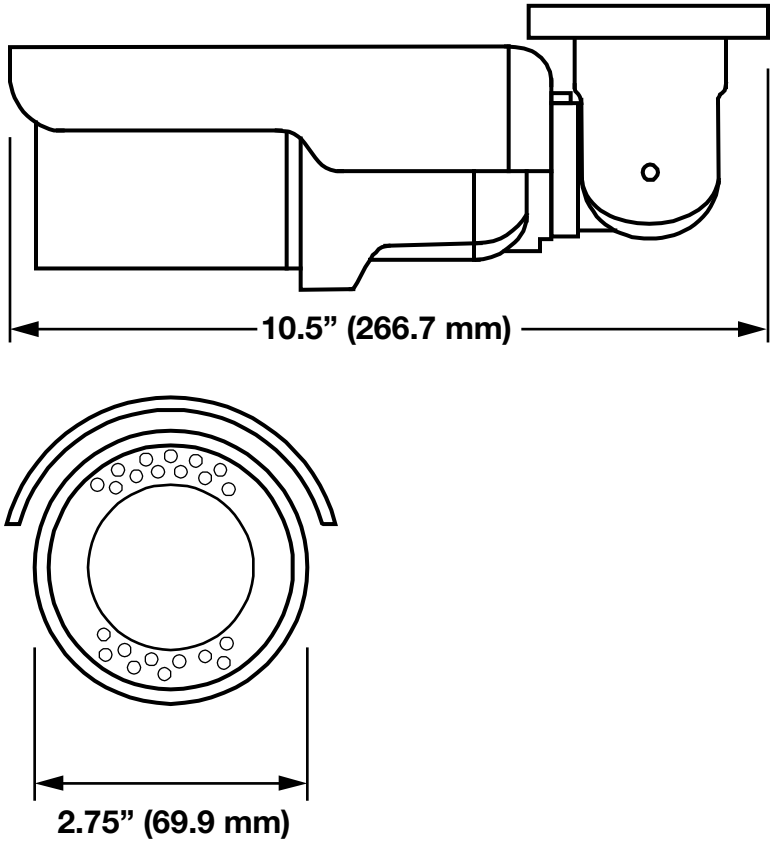
CAMERA OVERVIEW

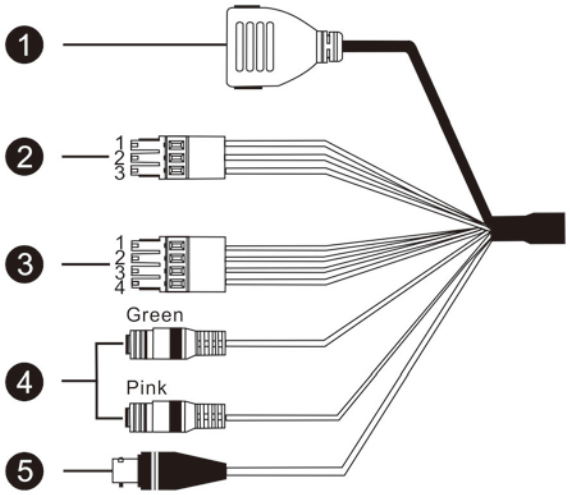
Before installing or connecting the camera, please refer to this section, including an overview of the all-in-one cable for reference.

Dimensions



- Length – 10.5 inches (84 mm)
- Width – 2.75 inches (69.9 mm)
- Height – 3.25 inches (82.55 mm)

Connections

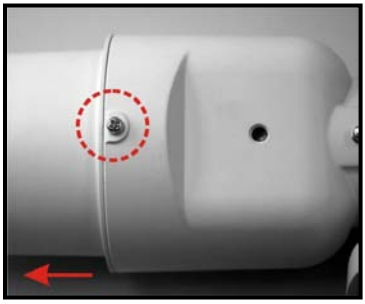


No.	Item	Pin	Definition		Remarks
1	Network (with PoE)	-	RJ-45 connector w/ LED		
2	Power (3-pin Terminal Block)	1	AC 24V-1	DC (-)	Power connection
		2	GND	Reserved	
		3	AC 24V-2	DC (+)	
3	Alarm I/O	1	ALM_DI-		Alarm connection
		2	ALM_DI+		
		3	ALM_DO-		
		4	ALM_DO+		
4	Audio I/O	Pink	Line In/Mic In		Two-way audio transmission
		Green	Line Out		
5	BNC	-	Video out		

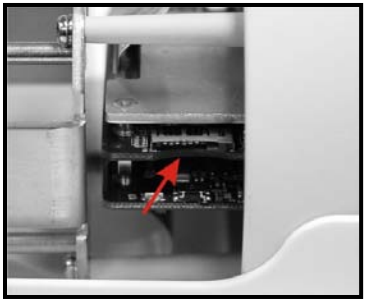
Micro SD Card Slot and Reset Button

Use these photos to reach the Micro SD card slot, reboot button, and factory default button.

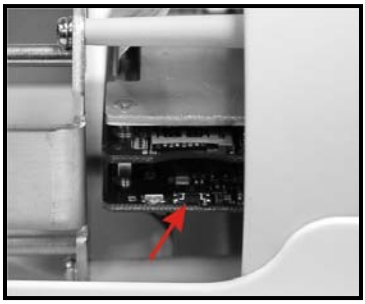
1. Unscrew the camera housing to remove front cover.



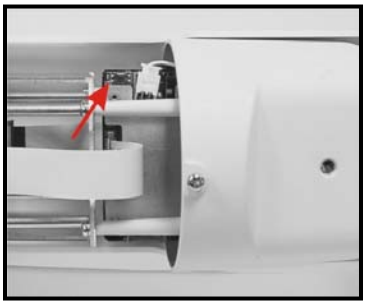
2. Micro SD card slot



3. Factory default button



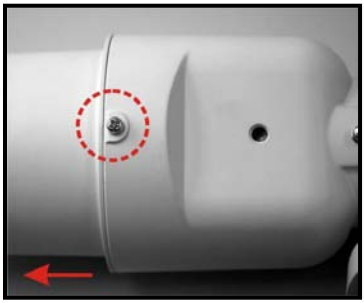
4. Reboot Button



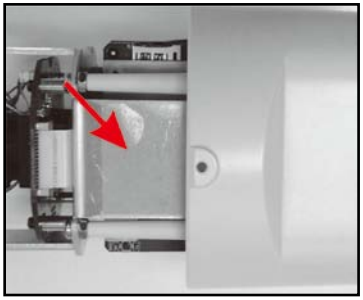
Installing the Desiccant

To prevent condensation on the glass cover of the CM-722, OpenEye recommends placing the desiccant in the camera before installation and replacing the desiccant each time the front cover is opened.

1. Unfasten the screw on the camera housing and remove the front cover



2. Carefully tear open the aluminum desiccant envelope and remove the desiccant.
3. Remove paper backing from the adhesive strip on the desiccant packet.
4. Place the desiccant firmly in the position indicated in here.



5. Reinstall the front cover and fasten the screw.

INSTALLATION

POWER AND ETHERNET CONNECTION

Read the installation instructions before installing and connecting the IP camera.

Power Connection

Make sure that the camera's power cable is correctly and firmly connected..

Note OpenEye recommends against using more than one power source at a time. Do not use a PoE power source when providing the camera with 12vDC or 24vAC power.

Make sure the camera's power cable is correctly and firmly connected. If using Power over Ethernet (PoE), make sure Power Sourcing Equipment (PSE) is in use in the network.

Ethernet Cable Connection

OpenEye recommends using Category 5 Ethernet cable to connect the camera to your network. For the best transmission quality, the cable length should not exceed 328 feet (100 meters). Connect a network cable to the camera using the RJ45 input and connect the other end of the cable to your network switch or recorder.

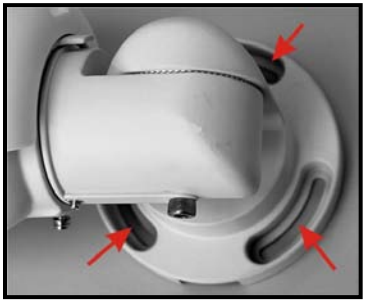
Note If you are connecting the camera directly to a recorder, a crossover cable is necessary for most configurations.

Check the status of the network connection by looking at the link indicator and activity indicator LEDs. If the LEDs are not lit check your network connection. The green link LED indicates a network connection and the orange activity LED flashes to indicate network activity.

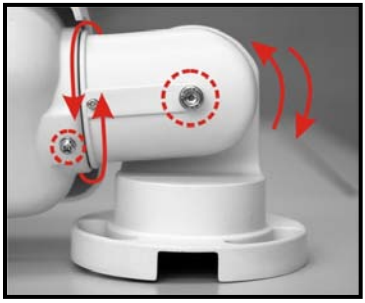
CEILING INSTALLATION

The IR Bullet IP Camera can be installed directly on a wall or ceiling provided it has enough strength to support the camera.

1. Remove the IR Bullet IP Camera from packaging
2. Connect power, Ethernet, Alarm and audio wires from ceiling or wall to the corresponding connectors of the cameras all-in-one cable.
3. Fix the camera's bracket on the ceiling or wall with the three supplied self-tapping screws.



4. Use the supplied inner hex wrench and a Phillips screwdriver to loosen the hex bolt on the side of the bracket mount and the camera housing to adjust the position of the camera.



Note CM-722 cameras are equipped with a seal inside the housing to prevent moisture from entering. If you have any concerns about moisture entering the housing or wall through the cable egress , OpenEye recommends sealing the opening at the wall and at the base of the camera with silicone caulking.

LENS ADJUSTMENT

1. Unscrew the camera housing to remove front housing.

2. Connect the power, audio, and alarm wires to their corresponding connectors. (Refer to the pin definition table.)
3. Access the camera browser in order to view images.
4. Adjust the zoom/focus ring screw on the lens to set the desired zoom and focal length.
5. Replace front housing and tighten screw.

LOCATE CAMERA

OPENEYE NETWORK CAMERA MANAGER

Use the included Network Camera Manager software to easily find your network cameras for initial setup. The OpenEye IP Finder software is included on the CD with all OpenEye IP devices.

Installation

You can install Network Camera Manager on any personal computer (PC) or laptop using the software CD included with your OpenEye IP camera or by downloading the program from openeye.net.

Note Network Camera Manager will only work on PCs or laptops that use a Windows operating system. It is compatible with Windows XP, Vista, 7, and 8.

Starting Network Camera Manager

After installing the program on your PC or laptop, open the program to begin configuring your cameras.

To access Network Camera Manager on an OpenEye recorder, you must operate the recorder in Windows Mode.

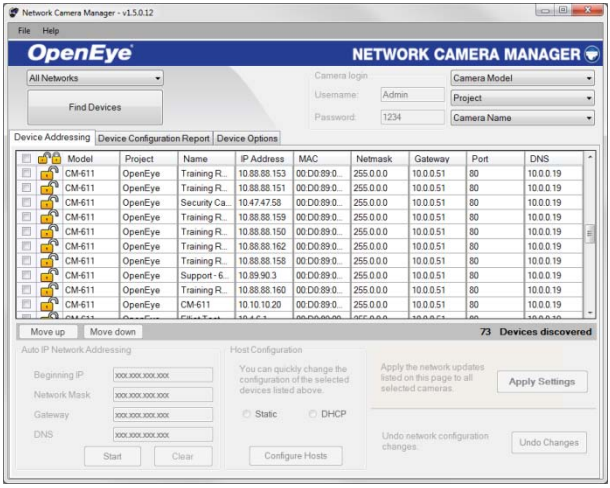
1. In the Live Screen, click **Exit**.
2. Click **Restart in Windows Mode**.
3. Click **OK**.
4. Double-click **Network Camera Manager**.

Device Addressing

The functions on the Device Addressing tab allow you to find, configure, and view network cameras.

Finding Network Devices

5. Click **Find Devices** on the **Device Addressing** tab.
6. To narrow your search by **Camera Model**, **Project**, or **Camera Name**, select your desired criteria from the appropriate lists.



SETUP & CONFIGURATION

CONNECTING TO THE CAMERA

1. Locate the camera using the Network Camera Manager.
2. Double-click the camera to open the Viewer software in your web browser.
3. Log in to the camera with the appropriate **User Name** and **Password**.

Note The default User name is Admin and the default Password is1234. The username and password are case sensitive. OpenEye recommends you change the Admin password for security reasons.

Resetting the Camera

If it is necessary to reset the camera to the factory default settings, hold down the Reset button (see *Connections*) for 30 seconds. This will return all settings, including network setup, to the factory default. The IP address of the camera will return to 192.168.0.250.

Administrator/User Privileges

The Administrator account has the authority to configure the IP camera and authorize users' access to the camera. The User accounts have access to the camera with limited authority.

Connecting a Stream

OpenEye IP cameras are optimized for use with OpenEye recorders, but you can also connect to your OpenEye IP cameras using third party software like VLC media player (http://www.videolan.org).

To connect the camera you may need to provide the stream URL. All OpenEye IP cameras are capable of delivering two RTSP streams, as well as streaming MJPEG over HTTP. The stream URLs are listed below.

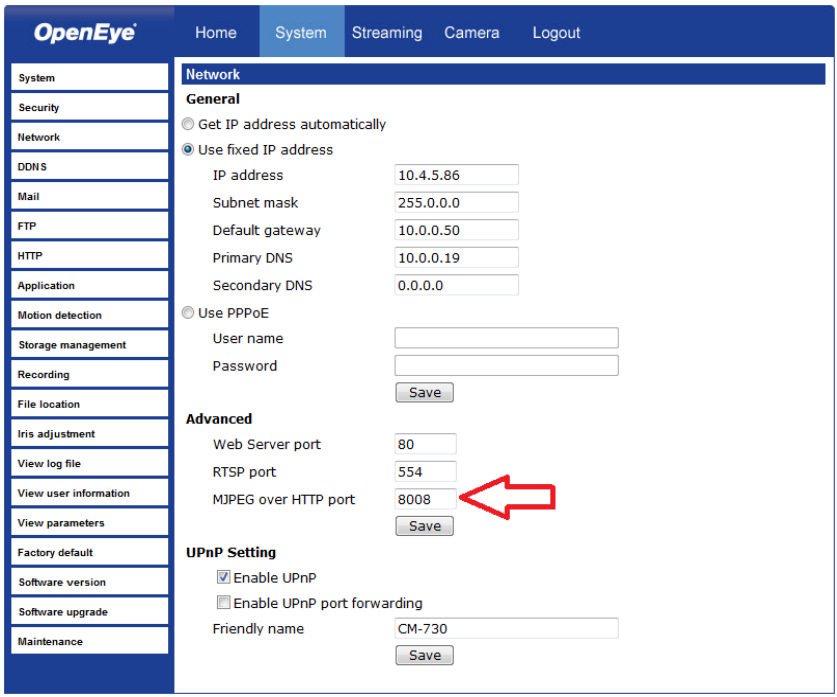
rtsp://<ip address>/mjpeg

rtsp://<ip address>/mpeg4

rtsp://<ipaddress>/h264

http://<ipaddress>:8008

The MJPEG over HTTP stream is identified by a port number. The default port is 8008; this port can be configured in the cameras **Network** page:



Connecting Over the Internet

There are some challenges with connecting to OpenEye IP cameras over WAN (internet) connections because the camera streams video over RTSP. RTSP is an excellent protocol for media and is now used on many IP cameras (including OpenEye) as the default streaming option.

However, RTSP is not suitable for transmission between two locations that are behind different routers. In this case, the client (for example, the OpenEye HVR or NVR server software) connects to the camera, then requests a stream. The camera uses that connection to return a stream, but since the connection originated on the client side and has now switched to the camera (remote) side, the router does not have any way to determine where the traffic should be routed, so no video appears at the recorder.

There are three solutions to this:

1. Connect modems on both sides directly to the recorder and camera. If there is no router, no network address translation is needed.
2. Use routers with VPN support and set up a small VPN. Once this is done, the traffic will be treated as though it were all on the local network.
3. **(Best solution)** – Use routers with **connection tracking**. This is quite easy; VOIP also uses RTSP and faces the same challenges. If a router is marketed as having “VOIP Support”, it will have the necessary connection tracking capability to allow any type of RTSP communication (not just VOIP).

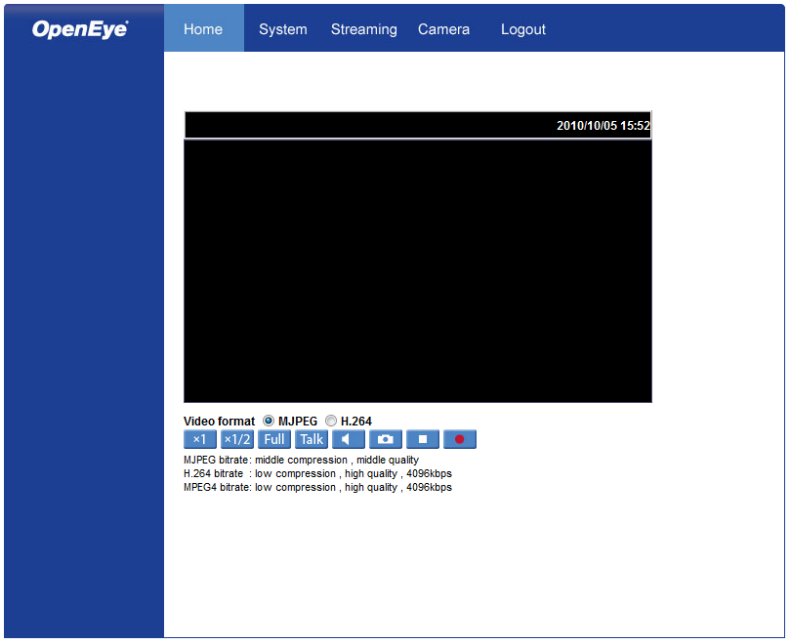
With proper planning and the correct equipment, RTSP cameras CAN stream over the WAN to a recording device for minimal additional cost and labor.

Please contact OpenEye support if you require any additional information on these topics.

VIEWER SOFTWARE

To access the setup menu, you need to install the viewer software on your PC or recorder. The viewer software will install automatically the first time you connect to the camera. If your internet browser doesn't install the viewer software, check the security settings or ActiveX controls and plug-in settings. For additional information on adjusting the settings of your Internet Explorer browser contact your system administrator or refer to openeye.net. If your internet browser asks for permission to install the ActiveX control, you must allow the ActiveX control to continue the installation.

The first time you connect to a camera, the browser will ask for permission to install the ActiveX Control necessary to display the camera video. Right-click the information bar and click **Install ActiveX Control** to allow the installation. If you experience issues, see Appendix A: Set Up Internet Security



Viewer Tabs

Home – Monitor live video.

System – Set the host name, system time, root password, and network related settings. (Admin access only)

Streaming – Modify the video resolution and select the audio compression type.

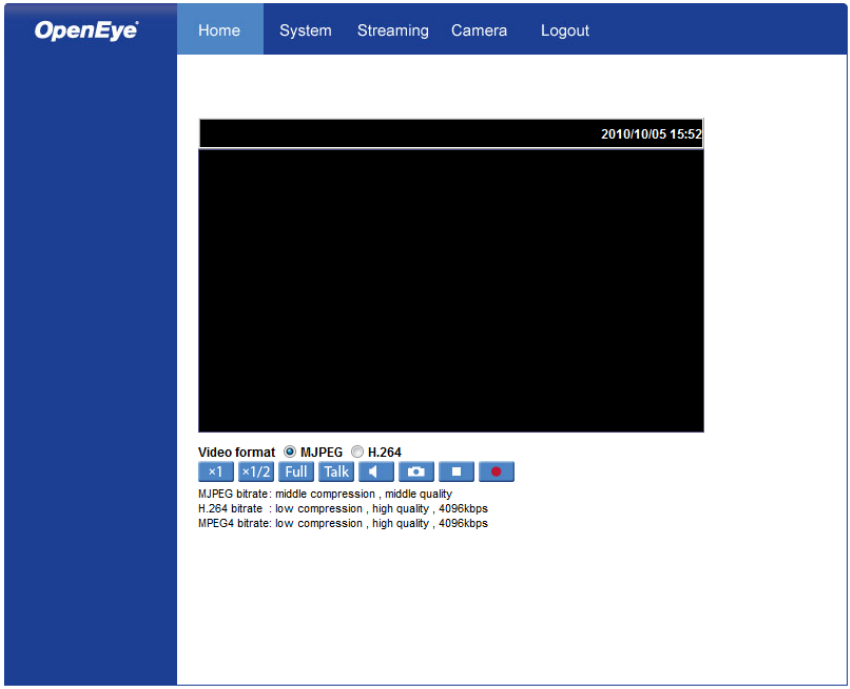
Camera – Adjust the camera parameters including Exposure, White Balance, Brightness, Sharpness, Contrast, and Digital Zoom.

Logout – Change user.

CM-722I and CM-722VF Models

Screen Size Adjustment – Click the screen size buttons to adjust image display size x1/2 and full screen.

Digital Zoom Control – In full screen mode, right-click to activate digital zoom and use the scroll wheel to zoom in/out.



Talk – Talk allows the local site to talk to the remote site. This function is only available to Users who have been granted this privilege by the Administrator.

Snapshot – Click the button, and a JPEG snapshot will automatically be saved in the appointed place. The default location is: C:\.

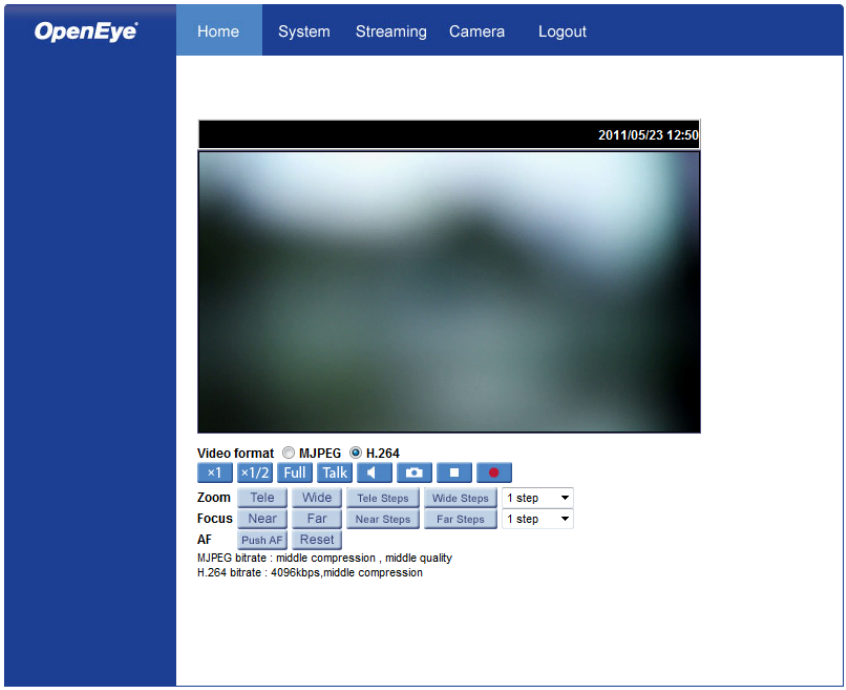
Note If you are using Windows Vista or 7, you will need to change the Snapshot location. Windows UAC does not allow internet programs to write directly to C:\ for security reasons.

CM-722AI

The CM-722AI is equipped with a motorized autofocus lens that makes installation quick and easy.

There are six main buttons that are used when setting up the CM-722AI:

- Zoom Tele
- Zoom Wide
- Focus Near
- Focus Far
- Push AF
- Reset



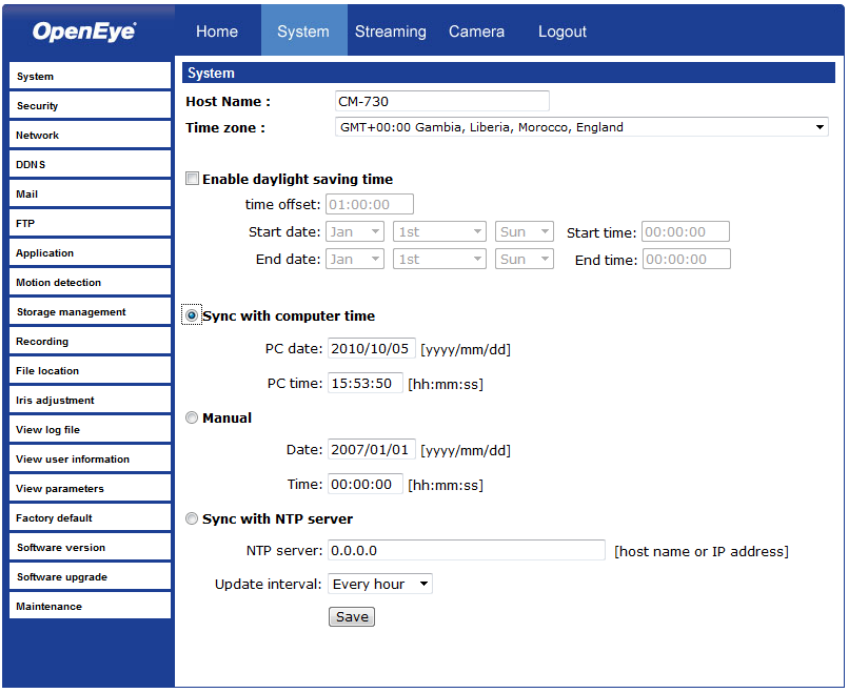
Use these buttons to control the camera's zoom and focus. Click **Push AF** to automatically focus the camera. The camera will keep this focus setting until it receives another command.

Once the CM-716A is installed in the preferred location, use the **Zoom** and **Focus** buttons to set the camera's field of view and then click the **Push AF** button to focus the camera. To return the lens to the default setting, click **Reset**.

System

Note The System tab is only accessible by the Administrator.

System



Host Name – The Host Name is used to identify the camera on your system. If camera-based Motion Detection is enabled and is set to send alarm message by Mail/FTP, the host name entered here will display in the alarm message.

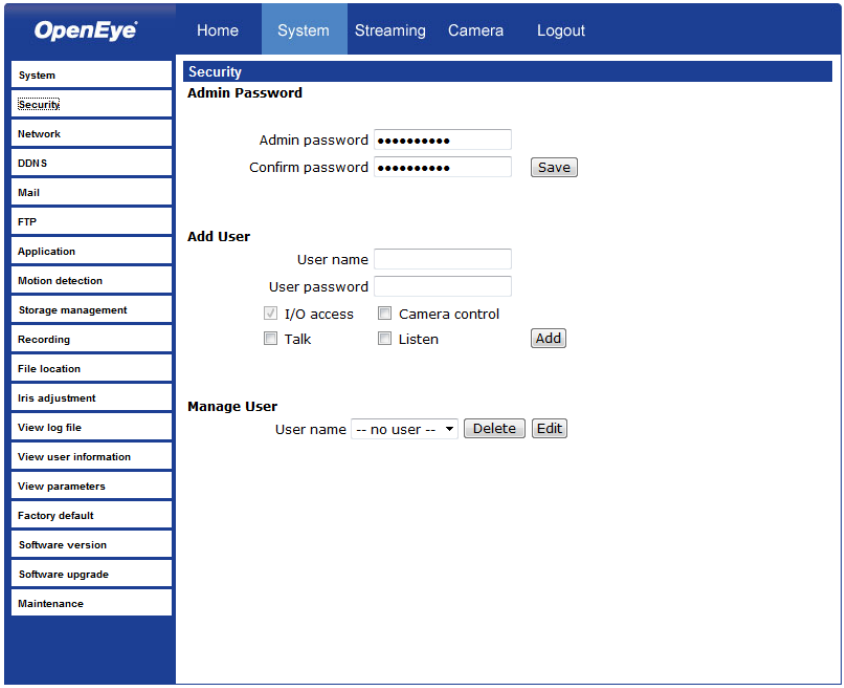
Time Zone – Select your time zone.

Sync With Computer Time – Select to synchronize the camera date and time with the connected PC or recorder.

Manual – Set video date and time manually.

Sync with NTP server – Network Time Protocol (NTP) is an alternate way to set your camera's clock by synchronizing with an NTP server. Specify the server you wish to synchronize in the **NTP Server** box. Then select an **Update Interval**. For more information about NTP, visit www.ntp.org.

Security



Admin Password

To change the administrator password, type a new password in the Admin Password box and confirm below.

Note The maximum length of the password is 14 characters. The following characters are valid: A-Z, a-z, 0-9, !#$%&'-.@^_~.

Add User

The user name and passwords are limited to 16 characters. The maximum number of user accounts is 20.

4. Type the new User name and Password.
5. Select the appropriate check boxes to give the user Camera Control, Talk and Listen permissions.

I/O access – Basic functions that enable users to view video when accessing to the camera.

Camera control – Allows the User to change camera parameters on the Camera tab.

Talk/Listen – Talk and Listen functions allow the user at the local site (DVR) to communicate with, the administrator at the remote site.

6. Click **Add.**

Delete user

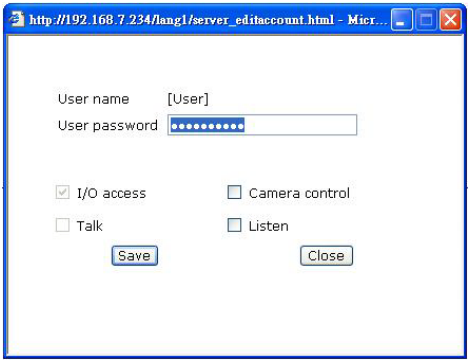
1. Select the user name on the **User Name** list
2. Click **Delete** to remove the user.

Edit user

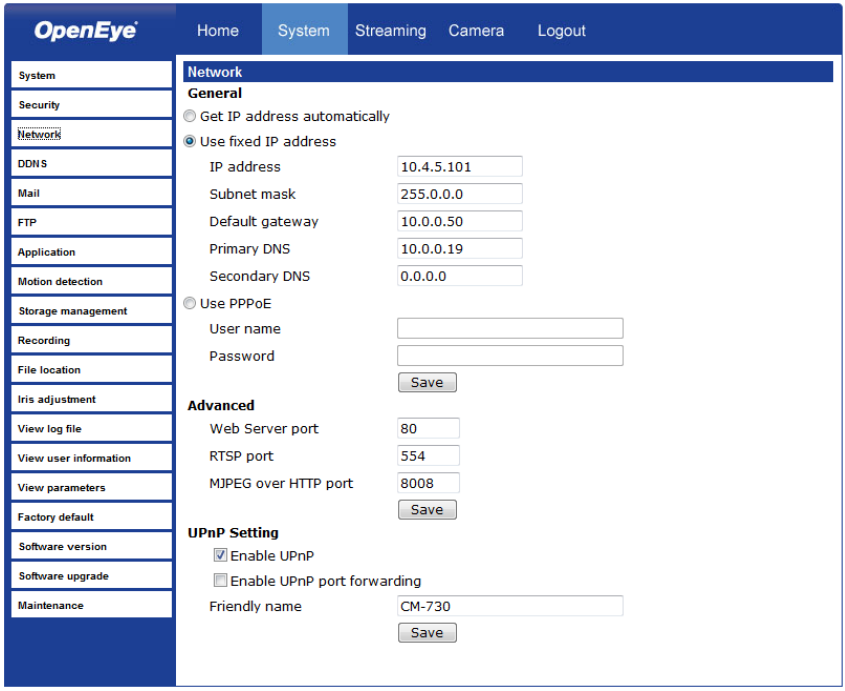
1. Select the user name on the **User Name** list
2. Click **Edit** to edit the user password and permissions.
3. Type a new password or the existing password in the User password box

Note You must type a password in the User password box to make any changes to an account.

Note For security reasons every time the user properties are opened, the access check boxes are automatically cleared. Make sure you select any user access options each time you edit the user properties.



Network



You can choose to use a fixed IP address or a dynamic IP address (assigned by a DHCP server or router) for the camera.

Get IP address automatically (DHCP)

The camera comes preconfigured with a fixed IP address.

Note Every network device has a unique Media Access Control (MAC) address that can be used for identification. The MAC address is located on the bottom of each camera, and on the box label (the OpenEye IP Finder also displays the MAC address for identification). Record your camera's MAC address for identification in the future.

Use fixed IP address

To set up a new static IP address:

1. Select the Use fixed IP address option.
2. Type a new IP address in the **IP address** box.
3. Type a new address in the Default Gateway box.
4. Click **Save** to confirm the new setting.

When using static IP address to log in to the IP Camera, you can access it either through OpenEye IP Finder software or type the IP address directly in the address bar of your internet browser.

General

- **IP address** – The IP Address is necessary for network identification.
- **Subnet mask** – Used to determine if the destination is in the same subnet. The default value is 255.255.255.0.
- **Default gateway** – Used to forward frames to destinations on different subnets or for internet access.
- **Primary DNS** – The primary domain name server that translates hostnames into IP addresses.
- **Secondary DNS** – A secondary domain name server that backups the primary DNS.
- **Web Server port** – Defines the port that Internet Explorer uses to connect over the web and view video. If this port is changed then the new port must be defined when attempting to web connect (ex: if your camera's IP address is 192.168.0.100 and you change the web port to 8001, then you must type http://192.168.0.100:8001 in your browser).

Advanced

- **RTSP port** – The default RTSP port is 554; setting range: 1024 ~65535.
- **MJPEG over HTTP port** – The default HTTP Port is 8008; setting range: 1024 ~65535.

Note The MJPEG over HTTP port cannot be the same as the web server port.

Use PPPoE

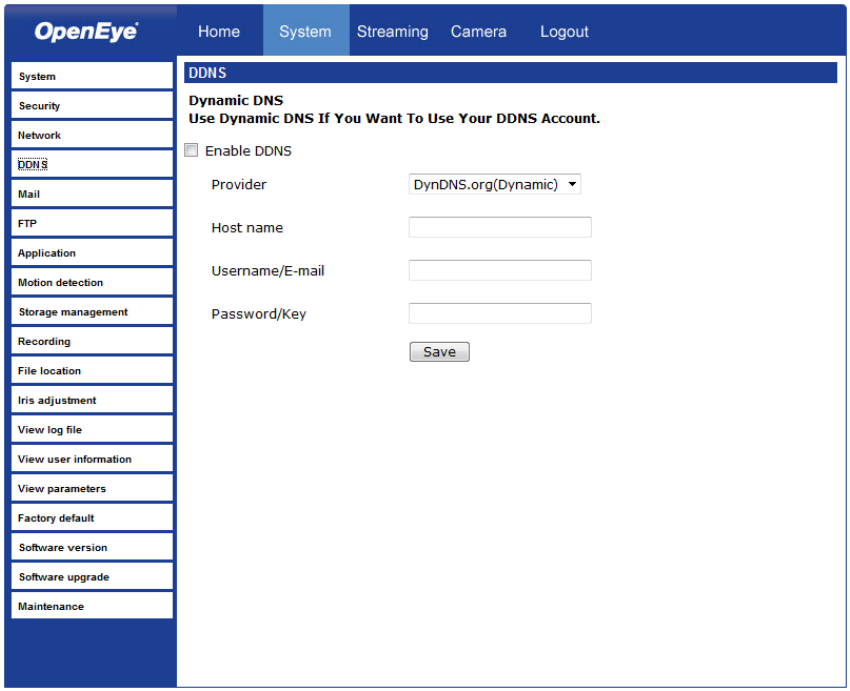
For PPPoE users, enter the PPPoE username and password into the fields and click **Save** to complete the setting.

IPv6 Address Configuration

With IPv6 support, users can use the corresponding IPv6 address for browsing. Enable IPv6 by checking the box, then click **Save** to complete the setting.

DDNS

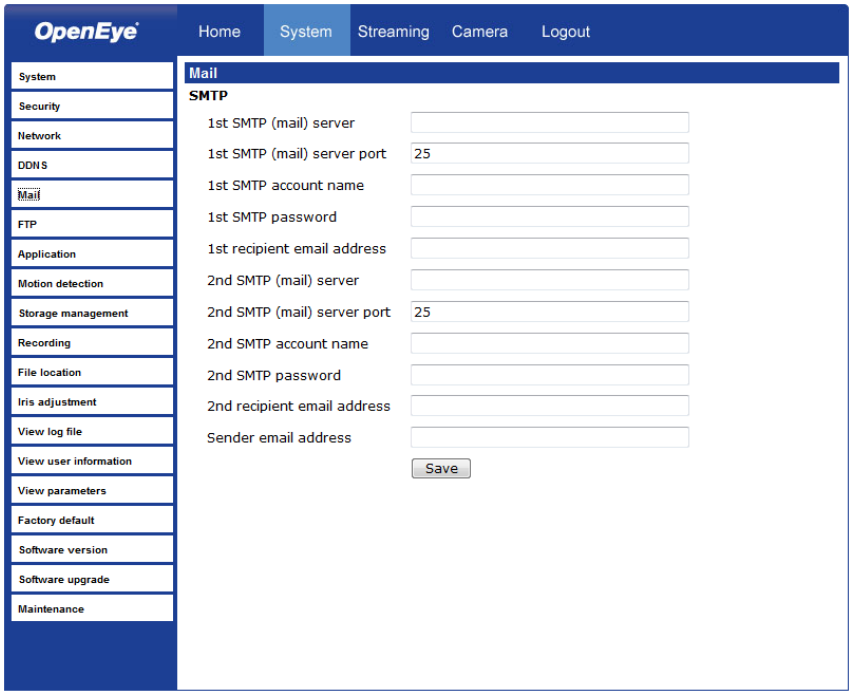
DDNS (Dynamic Domain Name Service) is a service that allows a connection to an IP address using a hostname (URL) address instead of a numeric IP address. Most Internet Service Providers use Dynamic IP Addressing that frequently changes the public IP address of your internet connection. This means that when connecting to the camera over the internet, you need to know if your IP address has changed. DDNS automatically redirects traffic to your current IP address when using the hostname address.



- **Enable DDNS** – Select the check box to enable DDNS.
- **Provider** – Select a DDNS host from the Provider list.
- **Host name** – Type the registered domain name in the field.
- **Username/E-mail** – Type the username or e-mail required by the DDNS provider for authentication.
- **Password/Key** – Type the password or key required by the DDNS provider for authentication.

Mail

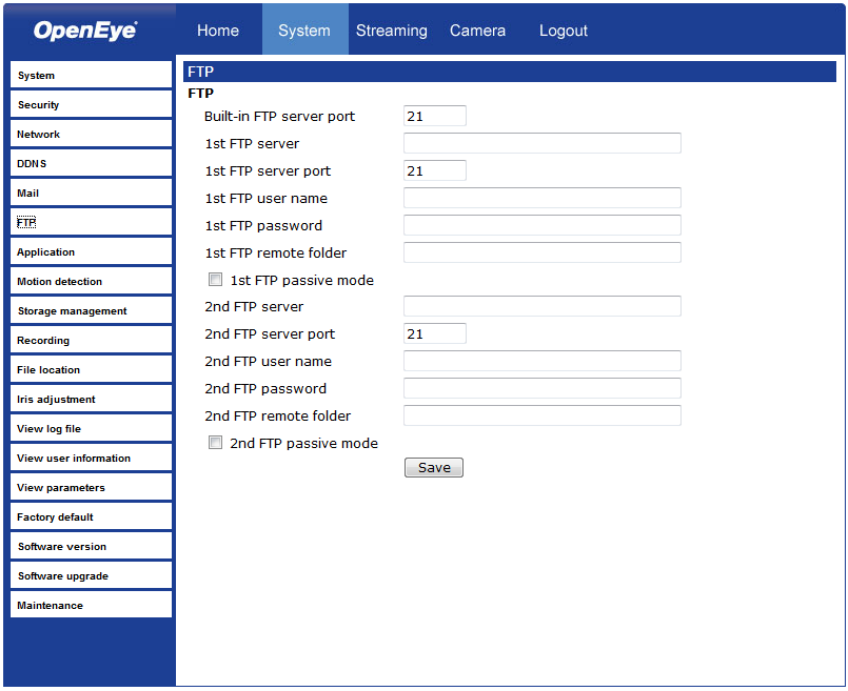
The camera can send an e-mail via Simple Mail Transfer Protocol (SMTP) when motion is detected or when the sensor input is activated. SMTP is a protocol for sending e-mail messages between servers. SMTP is a relatively simple, text-based protocol, where one or more recipients of a message are specified and the message text is transferred. The configuration page is shown as follows:



Two sets of SMTP accounts can be configured. Each set includes SMTP Server, Account Name, Password and E-mail Address settings. For SMTP server, contact your network service provider for more specific information.

FTP

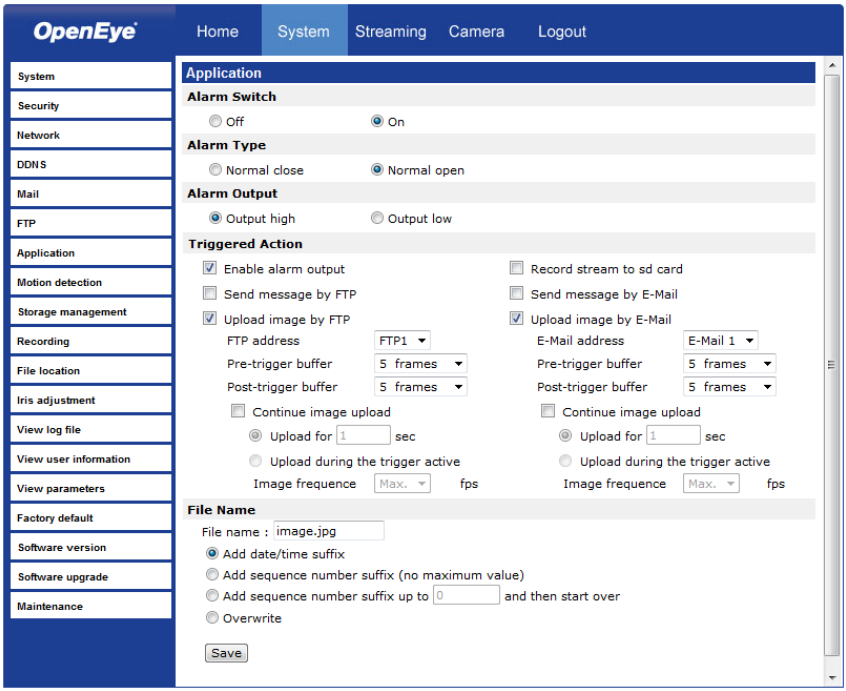
The camera can send alarm message to a specific File Transfer Protocol (FTP) site when motion is detected or when the sensor input is activated. You can assign alarm message to up to two FTP sites.



1. Enter the FTP details, which include server, server port, user name, password and remote folder, in the appropriate boxes.
2. Click **Save** when finished.

Application

The CM-722 is equipped with one alarm input and one relay output to connect to an alarm system to catch event images. Refer to **Camera Overview > Connections** to connect alarm devices to the IP Camera if needed.



Alarm Switch – Enable or disable the alarm function.

Alarm Type – Select an alarm type, “Normal close” or “Normal open,” that corresponds with the alarm application.

Alarm Output – Define alarm output signal “high” or “low” as the normal alarm output status according to the current alarm application.

Triggered Action – Specify alarm actions that will take place when the alarm is triggered.

- **Enable Alarm Output** – Select to enable relay output on alarm.
- **IR Cut Filter** – Select the item and the camera’s IR cut filter (ICR) will be removed or blocked when an alarm is triggered. The IR function cannot be set to auto mode if the triggered action is enabled.
- **Send Alarm Message by FTP/E-Mail** – Select to send an alarm message to a configured FTP and/or E-Mail address when an alarm is triggered. When sending to email, the alarm notification is text only. When sending to FTP, the alarm notification will upload a text file to the FTP location.

- **Upload Image by FTP** – Select to assign an FTP site. When the alarm is triggered, event images will be uploaded to the configured FTP site at the rate of one jpeg image per second.
- **Record Stream to SD Card** – Select the item and the alarm-triggered recording will be saved to your micro SD card. The pre-trigger buffer recording option allows users to check what happened to trigger the alarm. The pre-trigger buffer time range is from 1 to 3 seconds. Select **Upload for ___ Sec** to set the recording duration after the alarm is triggered. Select **Upload During Trigger Active** to record until the alarm is off. Local recording needs to be activated in order for this function to be implemented.
- **Upload Image by E-Mail** – Select to assign an e-mail address. When the alarm is triggered, event images will be sent to the configured e-mail address.
- **Send HTTP notification** – Select this item, select the destination HTTP address, and specify the parameters for event notifications when an alarm is triggered.

Note Make sure SMTP or FTP configuration has been completed. See the Mail and FTP section of this manual for further details.

File Name – Enter a file name in the box, ex. image.jpg. The uploaded image's file name format can be set in this section. Please select the one that meets your requirements.

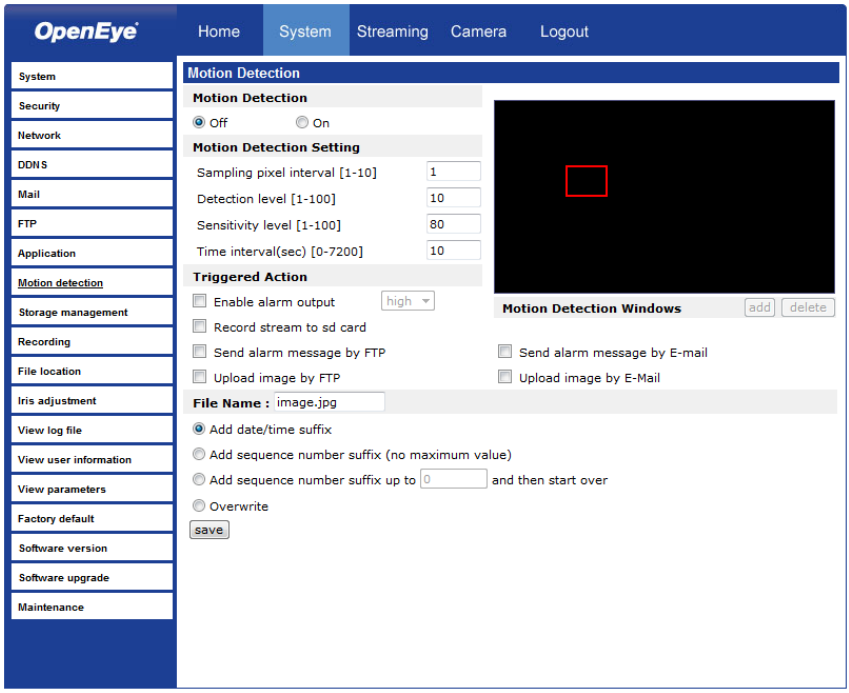
- **Add date/time suffix**
  File name: imageYYMMDD_HHNNSS_XX.jpg
  Y: Year, M: Month, D: Day
  H: Hour, N: Minute, S: Second
  X: Sequence Number
- **Add sequence number suffix (no maximum value)**
  File name: imageXXXXXXX.jpg
  X: Sequence Number
- **Add sequence number suffix (limited value)**
  File Name: imageXX.jpg
  X: Sequence Number

  The file name suffix will end with the value entered in this box. For example, if the setting is up to "10," the file name will start from 00, end at 10, and then start all over again.

Overwrite – The original image on the FTP site will be overwritten by the new uploaded file with a static filename.

Motion Detection

Motion Detection allows the camera to detect motion and trigger alarms when motion in the detected area exceeds the determined sensitivity threshold value.



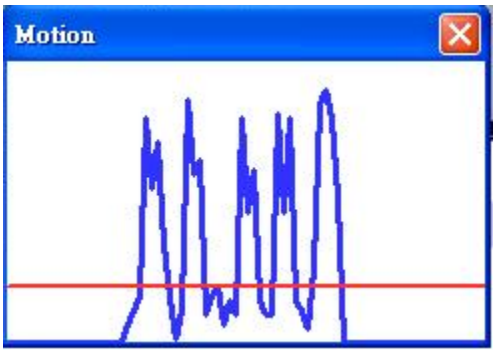
In the Motion Detection page, there is a motion detection window (red box) displayed on the Live View Pane. The Motion Detection window defines the motion detection area. To change the size of the Motion Detection window, drag the edge of the frame to resize.

You can add up to 10 motion detection windows.

- Click **Add** under the Live View Pane to add a Motion Detection window.
- To delete a Motion Detection window, use the mouse to select the frame and click **delete**.

When motion detection is activated, the **Motion** pop-up window will open.

When motion is detected, the signals will be displayed on the Motion window as shown below.



Motion Detection

Turn motion detection on or off. The default setting is Off.

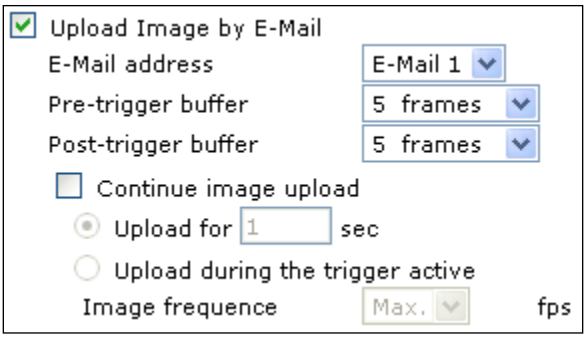
Motion Detection Setting

- **Sampling pixel interval [1-10]** – Default value is 10, which means system will take one sampling pixel for every 10 pixels.
- **Detection level [1-100]** – Default detection level is 10. This item sets the detection level for each sampling pixel; the smaller the value, the more sensitive it is.
- **Sensitivity level [1-100]** – The default sensitivity level is 80, which means if 20% or more sampling pixels are detected as changed, the system will detect motion. The bigger the value, the more sensitive it is. As the sensitivity value is increased, the red horizontal line in the motion indication window will be lowered accordingly.
- **Time interval (sec) [0-7200]** – The default interval is 10. The value is the interval between each detected motion event.

Triggered Action

You can specify which actions the camera should take when motion is detected.

- **Enable Alarm Output** – This will activate the camera's alarm output.
- **Record Stream to SD Card** – Select this item and the motion detection recording will be stored in the Micro SD/SDHC card when motion is detected. The pre-trigger buffer time range is 1-3 seconds. Select **Upload for ___ Sec** to set the recording duration after motion is triggered. Select **Upload During the Trigger** Active to record until the alarm is off.
- **Send Alarm Message by FTP/E-Mail** – Select to send an alarm message to a configured FTP server and/or e-mail address when motion is detected. When sent to e-mail, the alarm notification is text only. When sending to FTP, the alarm notification will upload a text file to the FTP location.
- **Upload Image by FTP** – Select to assign an FTP site and configure various parameters as shown in the figure below. When motion is detected, event images will be uploaded to the appointed FTP site.
- **Upload Image by E-Mail** – Select to assign an e-mail address and configure various parameters as shown in the figure below. When motion is detected, event images will be sent to the appointed e-mail address.



Note Make sure SMTP or FTP configuration has been completed. See the Mail and FTP sections for more information.

- **Send HTTP Notification** – Check this item, select the destination HTTP address, and specify the parameters for event notifications by motion detection. When an alarm is triggered, the notification can be sent to the specified HTTP server.

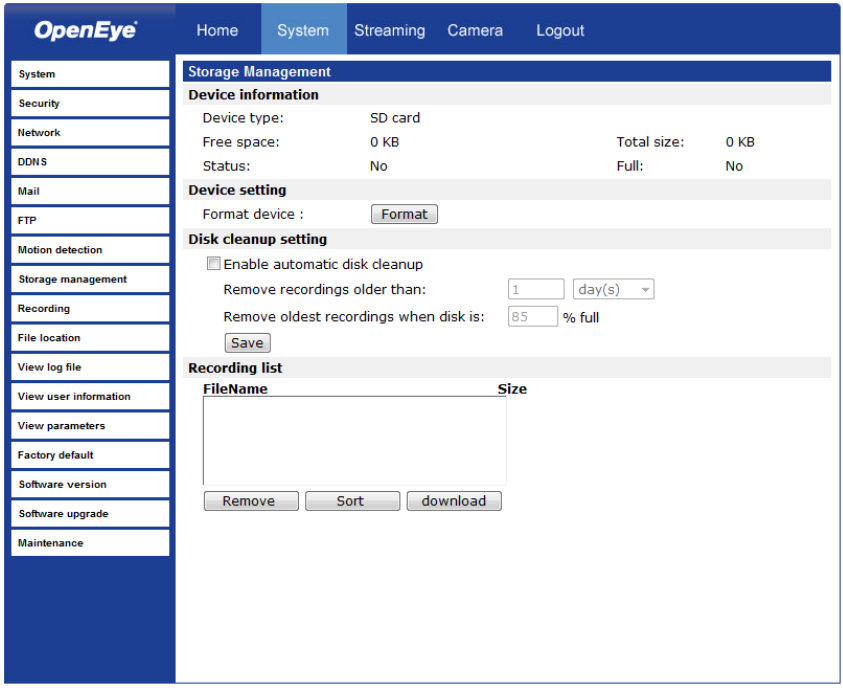
File Name – Enter a file name in the box, ex. image.jpg. The uploaded image's file name format can be set in this section. Please select the one that meets your requirements.

- **Add date/time suffix**
  File name: imageYYMMDD_HHNNSS_XX.jpg
  Y: Year, M: Month, D: Day
  H: Hour, N: Minute, S: Second
  X: Sequence Number
- **Add sequence number suffix (no maximum value)**
  File name: imageXXXXXXX.jpg
  X: Sequence Number
- **Add sequence number suffix (limited value)**
  File Name: imageXX.jpg
  X: Sequence Number

  The file name suffix will end at the value entered in this box. For example, if the setting is up to "10," the file name will start from 00, end at 10, and then start all over again.
- **Overwrite** – The original image on the FTP site will be overwritten by the new uploaded file with a static filename.

Storage Management

The CM-722 has an integrated microSD™ card that can be used to record video or images. The card slot is compatible with a microSD™ card up to 32GB.



Device Information – Displays the storage total size and free space information of the included microSD™ card.

Device Setting – Allows you to format the microSD card. (You will need to format the card when using it for the first time.)

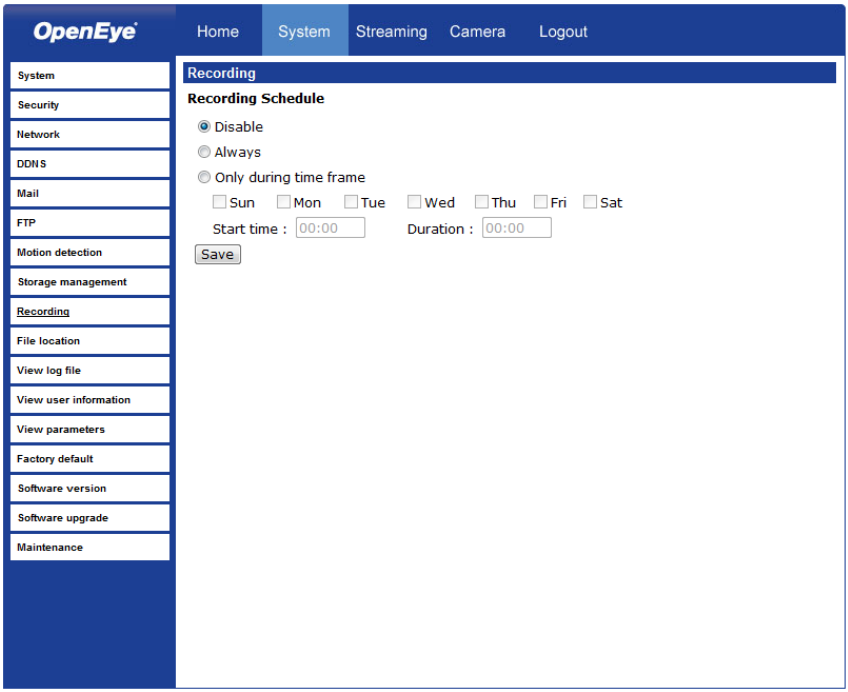
Device Cleanup Setting – Use this feature to enable overwrite settings on the SD card. The camera can remove files from the card after they reach a certain age, or when the card is a certain percent full.

Recording List – Displays a list of files saved to the card. You can delete files from the card, or save them to your local PC.

Note If you are using Windows Vista or 7, you will need to change the Snapshot location. Windows UAC does not allow internet programs to write directly to C:\ for security reasons.

Recording

The recording schedule allows you to set up scheduled recording to the microSD™ card.



Recording Schedule – The camera can be set up to record continuously until the card is full (or overwrite old data, see the Storage Management section). The camera can also be set up to record only during a scheduled time. Select the days that you would like to record, then input the recording start time and the recording duration.

Activating microSD/SDHC Card Recording – Two types of schedule modes are offered: **Always** and **Time Frame.** You can set up the time frame to fit the recording schedule or choose **Always** to activate the microSD/SDHC card to record all the time.

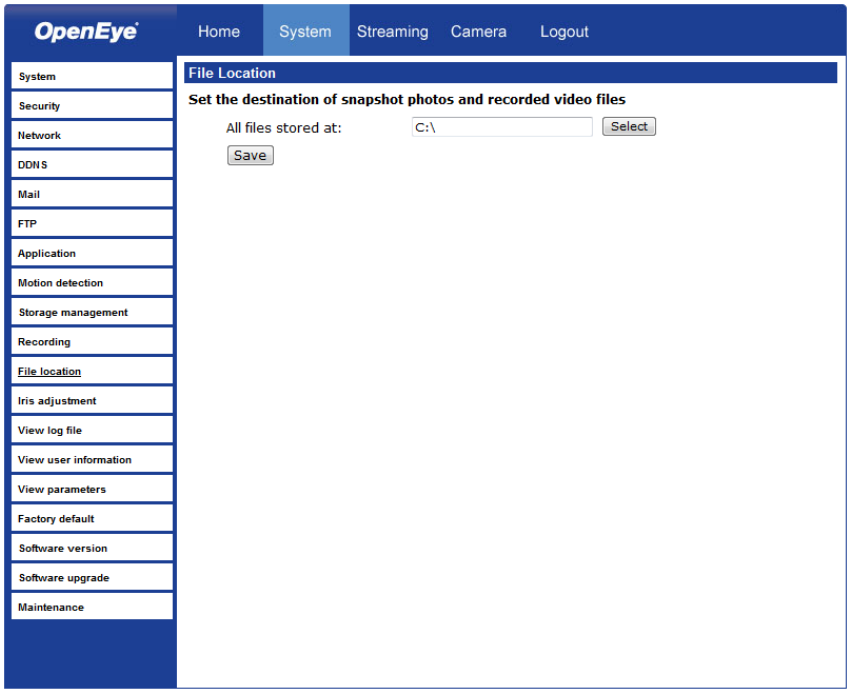
Terminate microSD/SDHC Card Recording – Select **Disable** to terminate the recording function.

Snapshot

The camera supports a JPEG snapshot function. You can specify a storage location for the snapshot images. The default location is: C:\.

Note If you are using Windows Vista or 7, you will need to change the Snapshot location. Windows UAC does not allow internet programs to write directly to C:\ for security reasons.

Note Make sure the selected file path contains valid characters such as letters and numbers.

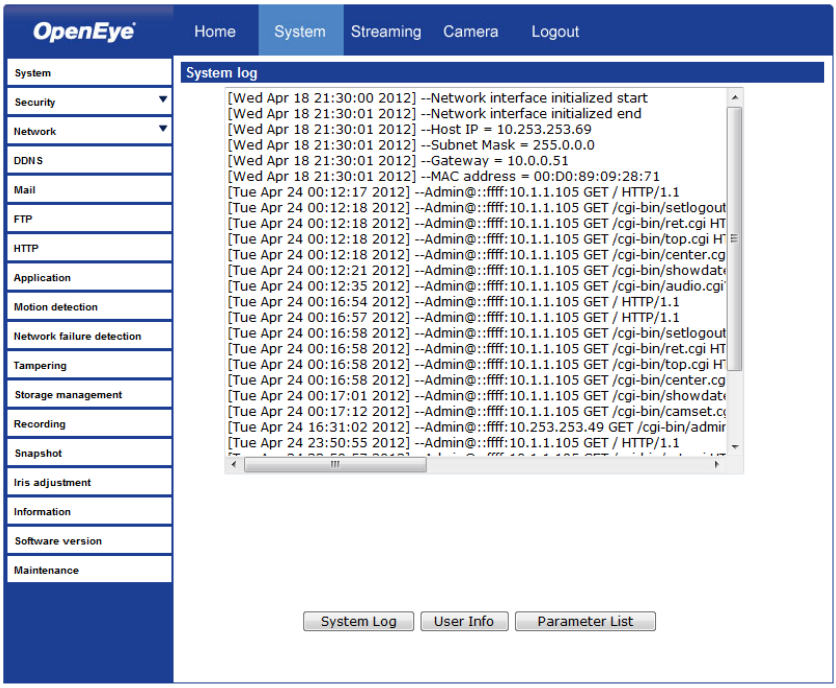


Information

The **Information** page contains the camera's System Log, User Information and Parameter List.

System Log

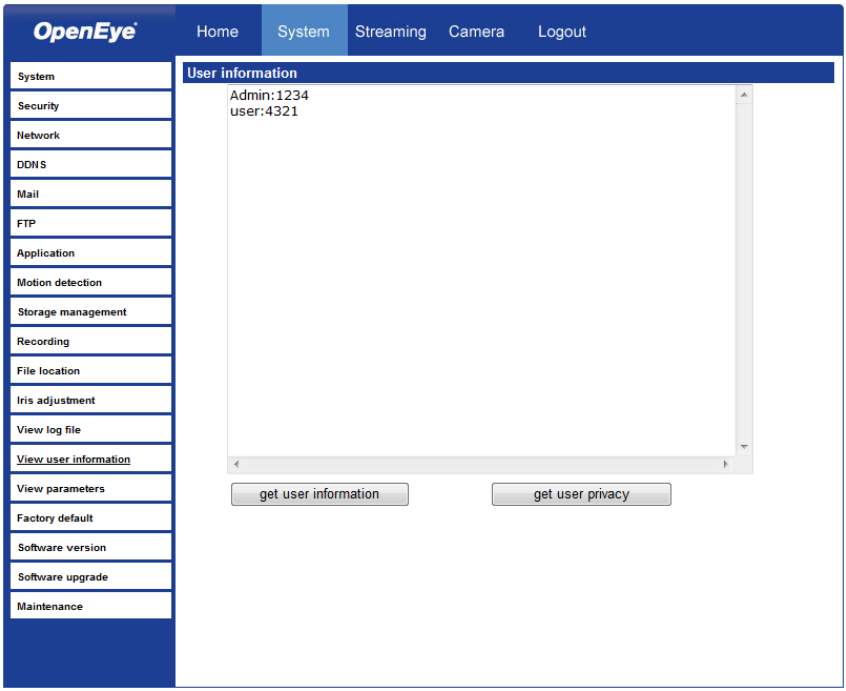
Click **System Log** to view the system log file. The content of the file provides useful information about configuration and connections.



View User Information

The Administrator can view each user's login information and privileges on the **View User Information** page.

All users for the camera are listed under **User information**. The example below shows that the Admin password is 1234 and there is one user named User with the password 4321.

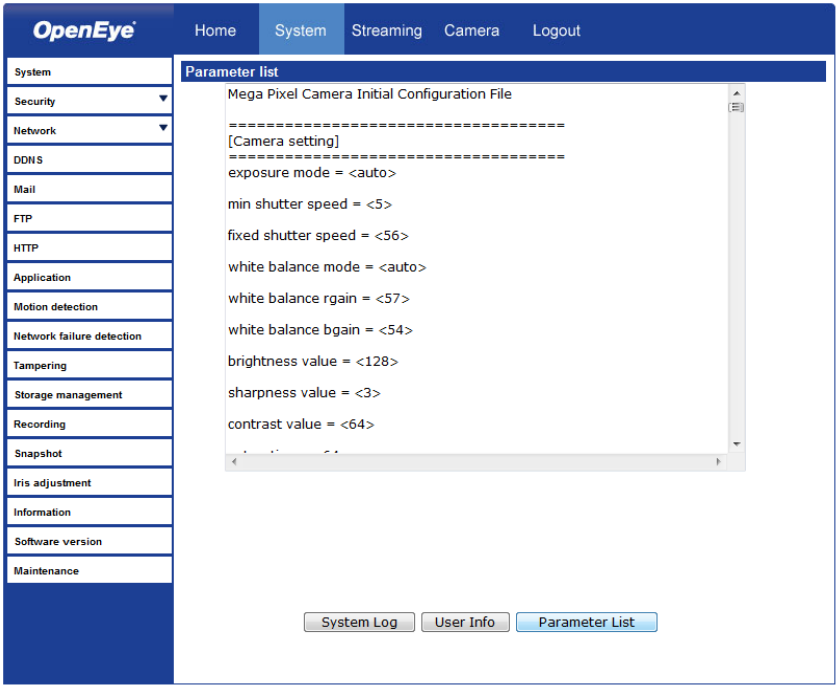


View User Privilege

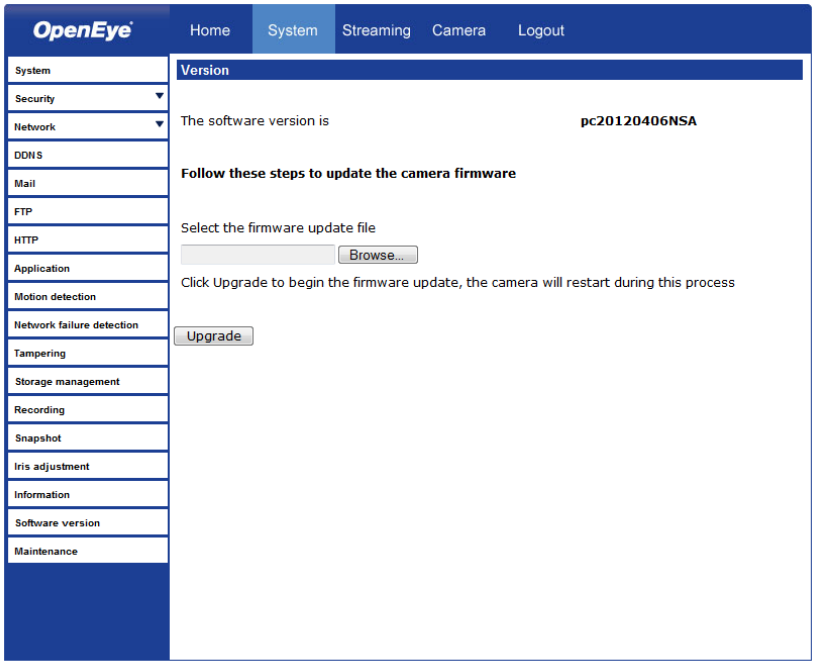
Select a user account from the list and click **get user privacy** to view the permissions for the user account.

Parameter List

Click **Parameter List** to view the system parameter settings.



Software Upgrade



Upgrading the Camera Viewer Software

Note Make sure the new firmware file is available before starting a software upgrade.

1. Click **Browse** and select the firmware file.

Note Do not change the file name, or the system will not be able to update to the new firmware.

2. Select the file type from the list under **Step 2**.
3. Click **Upgrade**. The system will check the upgrade file, and then upload the file. The upgrade status bar will display on the page. When it reaches 100%, the upgrade process is finished and the camera will return to the main page.

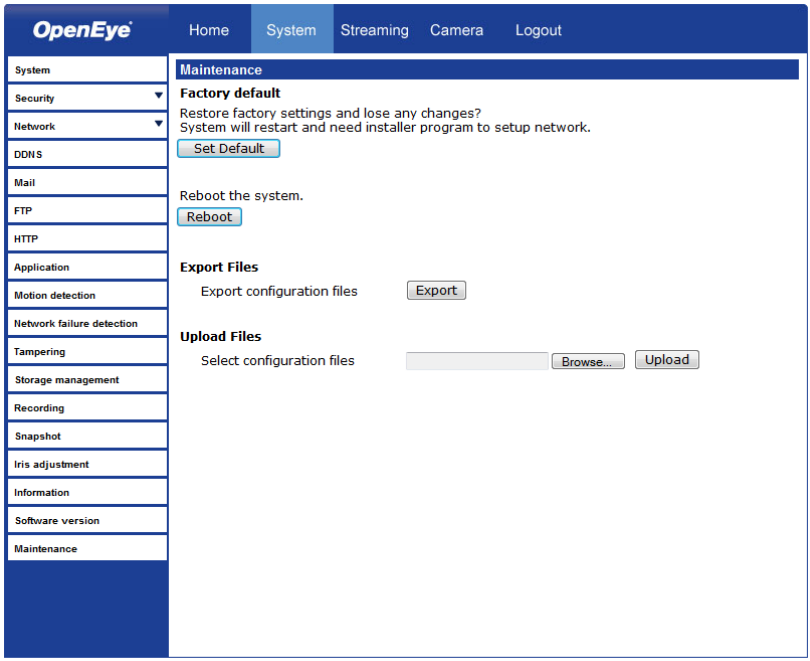
When the upgrade process is complete the viewer will return to the Home page. After updating it is important to make sure the camera viewer software is updated:

1. Close your browser.
2. Go to the **Windows Control Panel** and double-click **Add or Remove Programs**. Locate the **Camera Viewer** software on the **Currently installed programs** list, and click **Remove** to uninstall the previous software version.
3. Open the internet browser again and login to the IP camera. The system will automatically download the new version of the Camera Viewer software.

Maintenance

On the Maintenance page you can export the cameras current configuration, or import the configuration for a camera. Use the factory default page to reset the IP Camera to factory default settings if necessary.

Note Do not import configuration files from different models of cameras.



Set Default –To reset the IP camera to the factory default settings, including the default IP address, click Set Default. The system will restart after 30 seconds. If you cannot access the camera menu, you can return the camera to the factory default settings by holding down the reset button on the camera connection board for 30 seconds. See *Connections* for the button location.

Reboot – To restart the IP camera without changing the current camera settings, Click **Reboot.**

Export – You can save the system settings by exporting the configuration file (.bin) to a specified location for future use. Click **Export**, then **Save**, and specify the desired location.

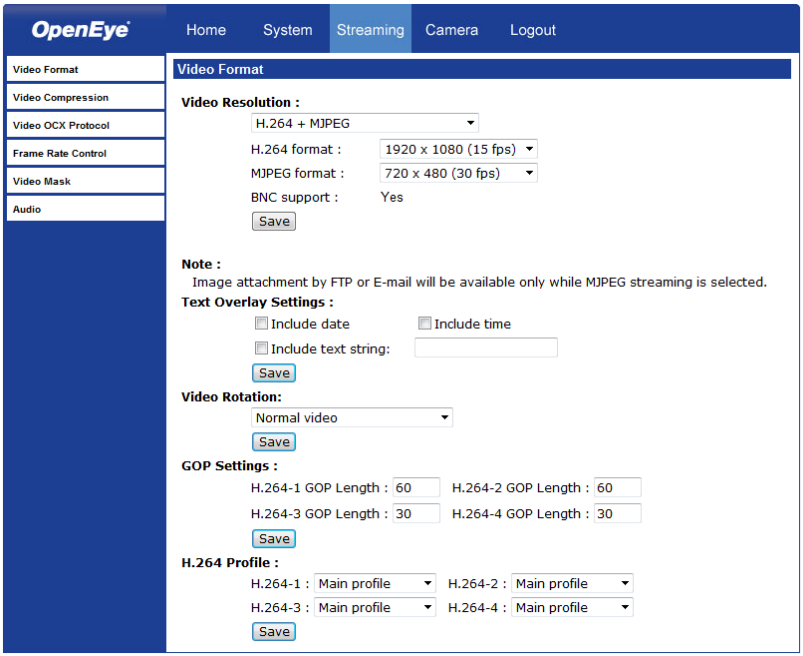
Upload – To copy an existing configuration file to the IP camera, click **Browse**, select the desired configuration file, then click **Upload**.

Video and Audio Streaming Settings

On the **Streaming** tab, you can configure specific video resolution, video compression mode, video protocol and audio transmission mode.

Video Format

Select the desired video resolution for the camera on the Video Format page. The DVR will record video based on the resolution selected here.



Text Overly Settings

Set up a text overlay for the transmitted video that can include the date, time, or custom text.

Video Rotate Type

You can change the orientation of the video output if necessary.

- **Normal** transmits the image as the camera sees it.
- **Flip** transmits the image upside down and mirrored.
- **Mirror** transmits a mirror image.
- **180 degree** transmits the image upside down.

GOP Settings

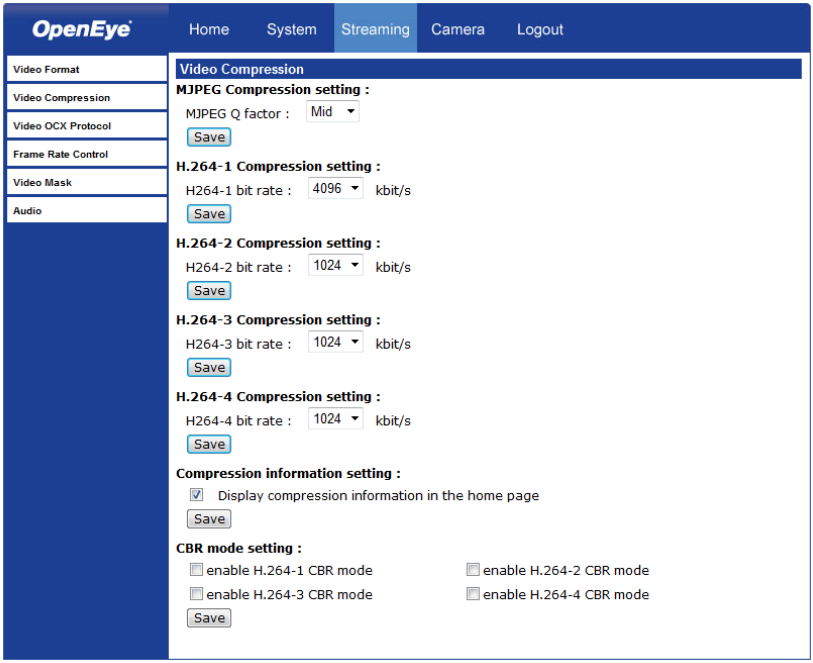
- Sets the Group of Pictures (GOP) length for the H.264 streams. Use this to increase bandwidth if necessary.

H.264 Profile

- Sets the H.264 Profile, or type of H.264 compression, for each H.264 stream. This may need to be changed only if you are using a 3rd party NVR that is not capable of decoding H.264 Main Profile.

Video Compression

You can select an MJPEG/H.264 compression mode on the video compression page appropriate for your application. You can also select to display compression information on the Home page.



MJPEG compression settings include:

- high compression, low bit rate, low quality
- middle compression, default
- low compression, high bit rate, high quality

H.264 compression settings include:

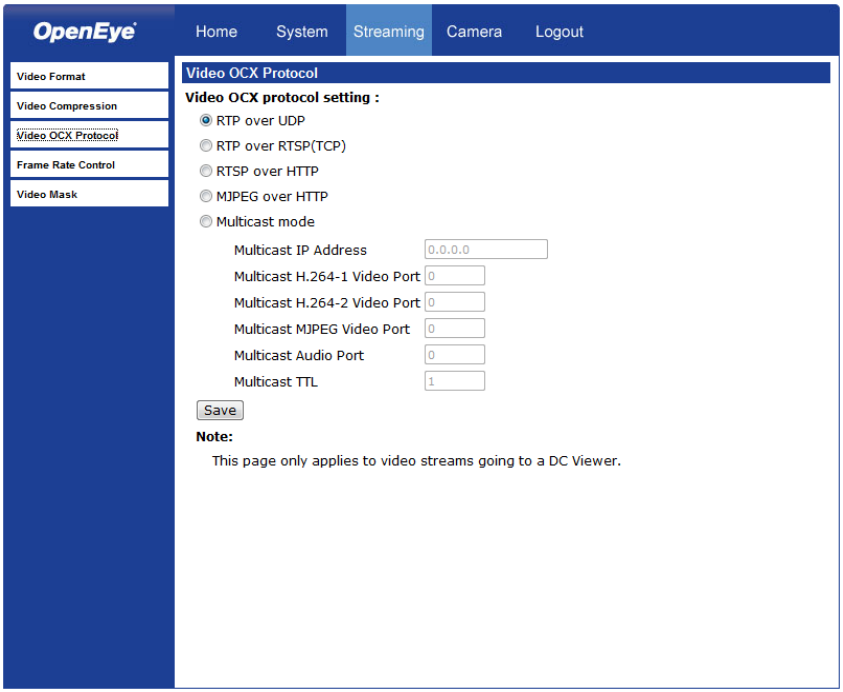
- 1024kbps, highest compression, lowest quality
- 2048kbps
- 4096kbps, middle compression, default
- 6144kbps
- 8192kbps, low compression, highest quality

CBR Mode Setting

- The Constant Bit Rate (CBR) mode could be the preferred bit rate mode if the bandwidth is limited. It is important to take account of image quality if choosing to use CBR mode

Video OCX Protocol

On the Video OCX protocol page, you can select different protocols for streaming media over the network. In the case of multicast networking, you can select the Multicast mode.



Video OCX protocol setting options include:

- RTP over UDP
- RTP over RTSP(TCP)
- RTSP over HTTP
- MJPEG over HTTP

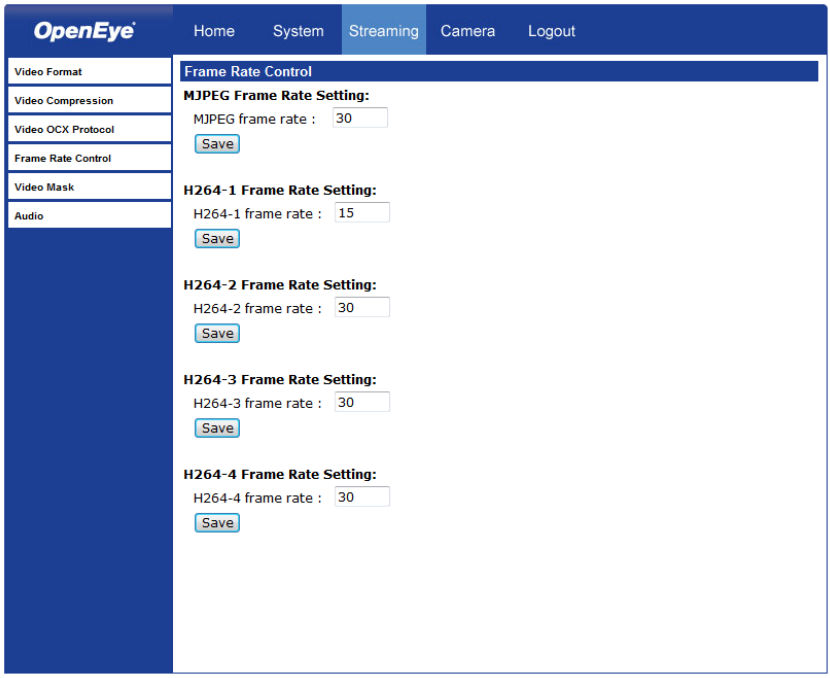
Select a mode according to your data delivery requirements. If you are transmitting over the internet using a router and port forwarding, you need to use RTP over RTSP (UDP). You also need to forward the RTSP port to the camera (see the network setup page to find the RTSP port).

Multicast Mode

1. Enter all required data, including multicast IP address, H.264 video port, MJPEG video port, audio port and TTL into each box.
2. Click **Save** to confirm the setting.

Frame Rate Control

Setting the camera to transmit fewer frames can save bandwidth.

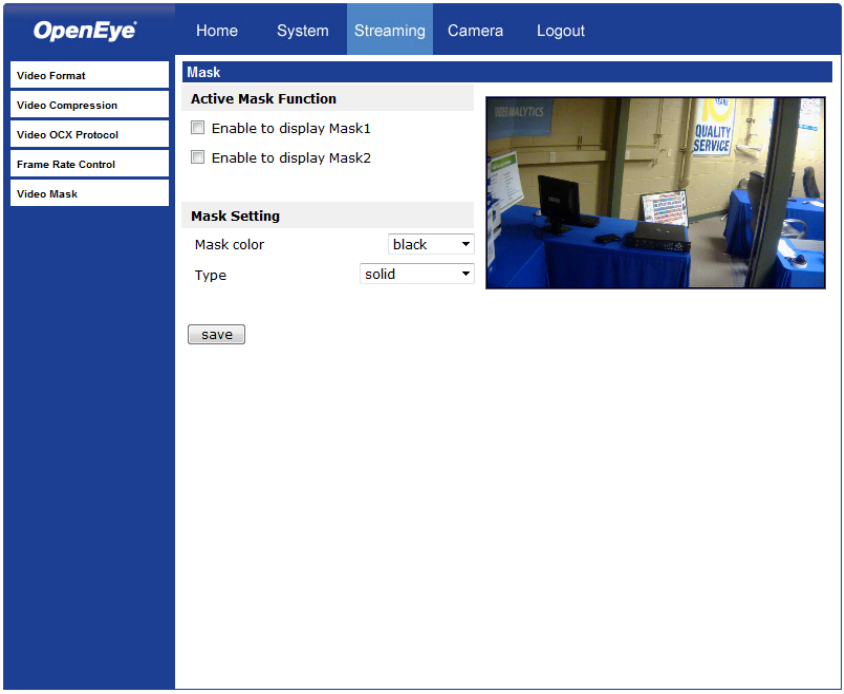


Each of the MJPEG and H.264 streams can have a separate frame rate setting from 1 to 30 frames per second

Note When set to 1920 x 1080, the max frame rate decreases to 15 frames per second.

Video Mask

You can use the video mask page to define a privacy mask to keep users from viewing parts of the image.



You can add two privacy masks and choose a color to obscure the live view from users.

Active Mask Function

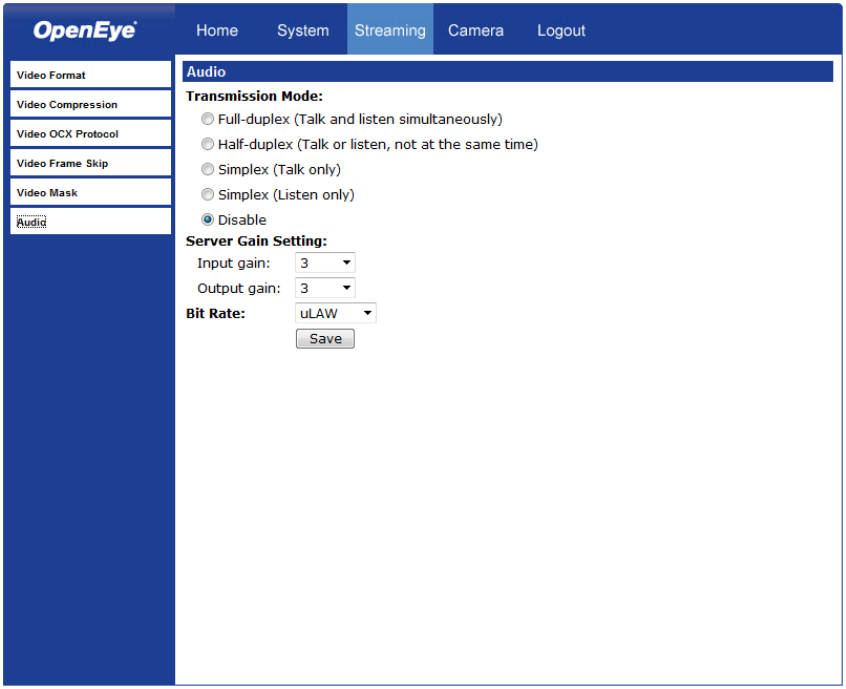
- **Add a Mask** – Check a video mask checkbox. Use the mouse to drag, drop, and adjust the mask size and placement.
- **Cancel a Mask** – Uncheck the checkbox for the desired mask.

Mask Setting

- **Mask Color** – Masks can be red, black, white, yellow, green, blue, cyan, and magenta.
- **Type** – Masks can be solid or transparent.

Audio

On the Audio page, the Administrator can select an audio transmission mode and audio bit rate.



Note Audio monitoring and recording laws vary from location to location. It is highly recommended that you consult your local, state and federal laws to verify that you are in compliance before implementing audio recording.

Transmission Mode

- **Full-duplex (Talk and Listen simultaneously)** – In Full-duplex mode, the local and remote sites can communicate with each other simultaneously, i.e. both sites can speak and be heard at the same time.
- **Half-duplex (Talk or Listen, not at the same time)** – In Half-duplex mode, the local/remote site can only talk or listen to the other site at a time.
- **Simplex (Talk only**) – In Talk only Simplex mode, the local/remote site can only talk to the other site
- **Simplex (Listen only)** – The local/remote site can only listen to the other site.
- **Disable** – Turn off the audio transmission function.

Server Gain Setting

Set the audio input/output gain levels for sound amplification. The audio gain values range from 1 to 6. Sound can be turned off if audio gain is set to **Mute.**

Bit Rate

Selectable audio transmission bit rate include:

16 kbps (G.726)

24 kbps (G.726)

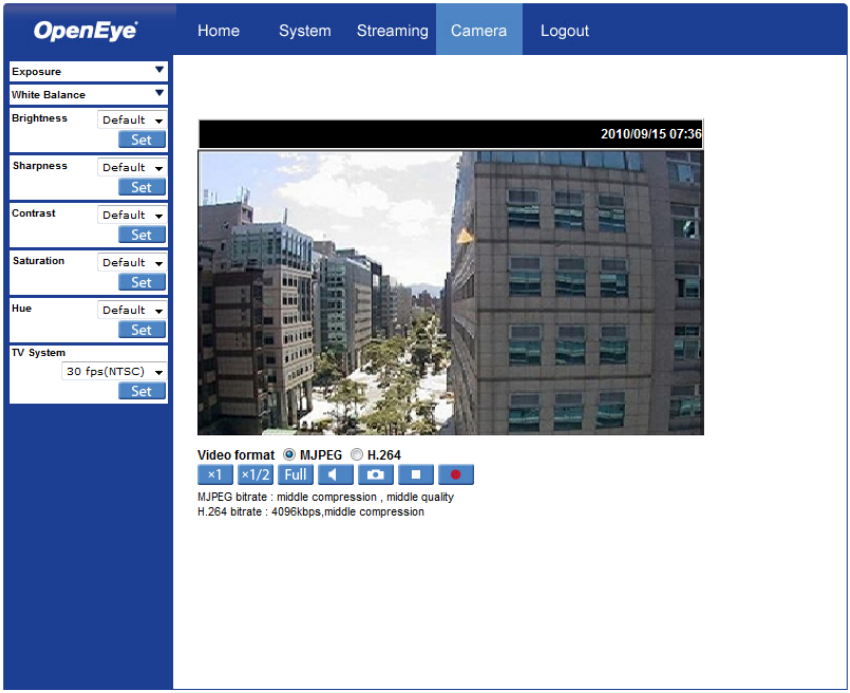
32 kbps (G.726)

40 kbps (G.726)

uLAW (G.711)

ALAW (G.711).

Both uLAW and ALAW signify 64 kbps but in different compression formats. Higher bit rate will provide higher audio quality and require more bandwidth.



Exposure

The exposure is the amount of light received by the image sensor and is determined by the width of lens diaphragm opening (iris adjustment), the amount of exposure by the sensor (shutter speed) and other exposure parameters.

Full Auto Mode

- In Full Auto mode, the camera's Shutter Speed, IRIS and AGC (Auto Gain Control) control circuits work together automatically to set a consistent video output level. The maximum shutter speed is adjustable from 1/30 to 1 sec.

Auto Iris Mode

- In Auto Iris mode, shutter speed and AGC circuit will function automatically in order to achieve a consistent exposure.

Fixed Shutter Mode

- In Fixed Shutter mode, fixed shutter speed are user selected from the available list. The shutter speed range is from 1/10000 to 1 sec. with 19 options. You can select suitable shutter speed according to the environmental illumination.

White Balance

A camera needs to find reference color temperature, which is a way of measuring the quality of a light source, for calculating all the other colors. The unit for measuring this ratio is in Kelvin (K). Users can select one of the White Balance Control modes according to the operating environment. The following table shows the color temperature of some light sources for reference.

Light Source	Color Temperature in K
Cloudy Sky	6,000 to 8,000
Noon Sun and Clear Sky	6,500
Household Lighting	2,500 to 3,000
75-watt Bulb	2,820
Candle Flame	1,200 to 1,500

Auto Mode

- In Auto mode, white balance works within its color temperature range and calculates the best-fit white balance.

Auto Tracking White Balance (ATWB) Mode

- In ATWB mode, the white balance will be automatically adjusted while the color temperature is changing.

Manual Mode

- In Manual mode, you can change the White Balance value manually, adjusting the R gain and B gain.

Backlight Setting

Backlight compensation prevents the center object from being too dark in surroundings where excessive light is behind the object.

Brightness

Adjust the image's brightness on the camera. The Backlight value is adjustable from -12 (dim) ~ +13 (brightest).

Sharpness

Increasing the sharpness level can make the image looked sharper; it especially enhances an object's edge. The value of sharpness is adjustable from +1 ~ +15 (sharpest) besides to default value.

Contrast

Correct the contrast of the entire image by adjusting the Contrast level, ranging from -6 ~ +19.

Saturation

Adjust the saturation of color components in an image through the Saturation function, which is adjustable from -6 ~ +19.

Digital Zoom

Zoom in to the center of the image.

IR Function

Adjust the IR cut filter settings for Day/Night functionality. When set to Auto the camera will analyze the video signal and choose when to switch from Day mode to night mode. When set to On the camera will always be set to night mode, and when set to Off the camera will always be set to day mode.

When set to Light Sensor the camera will only use the light sensor on the IR LED Array to determine when to switch to night mode, when set to Light On the camera will always have the IR LEDs turned on and when set to Light Off, the camera will always have the IR LEDs off, even when in night mode.

When set to Smart mode, the camera automatically stays in night mode if the IR illuminators remain on, even if the camera determines that it should switch to day mode.

TV System

Select the video format that matches the present video system.

Logout

Click the **Logout** tab to change users.

SPECIFICATIONS

CAMERA SPECIFICATIONS

Model	CM-722I	CM-722AI	CM-722VF
Image Sensor	1/2.7” Progressive CMOS		
Imaging DSP	Ambarella A5S		
IP Rating	IP66		
Type / Format	H.264 / MJPEG		
Wide Dynamic Range	Digital WDR		
Minimum Illumination	0.2 LUX (Color) / 0.02 LUX (B&W) / 0 LUX (IR LED)		
Day / Night	Yes (True Day / Night) + IR LED		
Resolution	15IPS @1920 x 1080 (2MP), 30 IPS @ 1280 x 1024 (1.3MP), 30 IPS @ 720p [1280 x 720 / 1MP), 30 IPS @ D1 [720 x 480], 30 IPS @ CIF (352 x 240]		
Service Monitor Jack	Yes (BNC)		
S/N Ratio	>50dB		
Focal Length	4mm fixed	3 ~ 9 mm motorized	3 ~ 9 mm varifocal
Iris Control	F1.5	F1.2	F1.2
Synchronization	–		
Video Output	1.0 Vp-p / 75Ω, BNC		
White Balance	Manual / AWB / ATW		
Auto White Balance Range	2700 K – 7800 K		
Backlight Compensation	On/Off		
Auto Gain Control	Auto/Manual adjustable through web		
Operating Temperature	-40°F ~ 122°F (-40°C ~ 50°C)		
Heater	Yes		
Power Consumption	5W + 3W (IR LED) + 12W (Heater) = 20W	5W + 3W (IR LED) + 12W (Heater) + 4W (Lens) = 24W	5W + 3W (IR LED) + 12W (Heater) = 20W
Rated Amperage	0.84A (24vAC)	1A (24vAC)	0.84A (24vAC)
Input Voltage	12vDC / 24vAC / PoE		
Weight	2.3 lbs (1 kg)		
Dimensions	L: 10.5” (266.7 mm) W: 2.375” (60.325 mm) H: 3.5” (88.9 mm)		
Housing / Dome Cover	White / Clear		

IR SPECIFICATIONS

Model	CM-722I	CM-722AI	CM-722VF
IR LEDs	23 IR LEDs (850nm)		
IR Range	Up to 50 ft (15 m)		

IP SPECIFICATIONS

Model	CM-722I	CM-722AI	CM-722VF
Video Compression	H.264 / MJPEG		
Dual Streaming	H.264 ONLY, MJPEG ONLY, H.264 + H.264, H.264 + MJEG, H.264 + H.264 + H.264, H.264 + H.264 + MJPEG, H.264 + H.264 + H.264 + H.264, H.264 + H.264 + H.264 + MJPEG		
Audio In	1		
Audio Out	1		
Alarm In	1		
Alarm Out	1		
User Account	20		

APPENDIX A

SET UP INTERNET SECURITY

If the installation of ActiveX Control is blocked, you will need to either set the Internet Security Level to the default setting, or change the ActiveX controls and plug-ins setting.

Setting Internet Security Level to Default

1. Open Internet Explorer.
2. Click the **Tools** tab in the menu bar.
3. Click Internet Options.
4. In the **Security** tab, select the appropriate **Internet Zone**.
5. Click Default Level.
6. Click **OK**.
7. Close the browser window. You will need to open a new window in order to access the IP camera.

Adjusting ActiveX Controls and Plug-ins

1. Open Internet Explorer.
2. Click the **Tools** tab in the menu bar.
3. Click Internet Options.
4. Click **Custom Level.** The **Security Settings** window will pop up.
5. Under **ActiveX Controls and Plug Ins**, set all items to **Enable** or **Prompt**. Items may vary according to your version of Internet Explorer.

ActiveX controls and plug-ins settings:

- Allow previously unused ActiveX controls to run without prompt.
- Allow Scriptlets.
- Automatic prompting for ActiveX controls.
- Binary and script behaviors.
- Display video and animation on a web page that does not use external media player.
- Download signed ActiveX controls.
- Download unsigned ActiveX controls.
- Initialize and script ActiveX controls not marked as safe for scripting.
- Run ActiveX controls and plug-ins.
- Script ActiveX controls marked safe for scripting.

6. Click **OK** to accept the settings and close the Security Settings window.
7. Click **OK** to close the Internet Options screen.
8. Close the browser window. You will need to open a new window in order to access the IP camera.

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